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10/650,087	08/28/2003	Tadahiro Ishizaka	070120-0305185	5900
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PILLSBURY WINTHROP SHAW PITTMAN, LLP			ZERVIGON, RUDY	
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MCLEAN, VA 22102			ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/650,087	ISHIZAKA ET AL.	
	Examiner	Art Unit	
	Rudy Zervigon	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 20 January 2009.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-23 is/are pending in the application.
 4a) Of the above claim(s) 17-23 is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-16 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1.) Certified copies of the priority documents have been received.
 2.) Certified copies of the priority documents have been received in Application No. _____.
 3.) Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____. | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 20, 2009 has been entered.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmi; Tadahiro et al. (US 6217633 B1) and Beyer; Christian et al. (US 5944049 A) in view of Miyashita, Takeshi et al. (JP 01188684 A). Ohmi teaches a substrate (2; Figure 1; column 2; line 10) treatment device (Figure 1; column 5) comprising: a treatment chamber (1; Figure 1; column 2, line 3) in which a substrate (2; Figure 1; column 2; line 10) is to be placed; a supply system (4,10; Figure 1; column 2; lines 5-20) configured to supply at least two kinds of treatment gases to said treatment chamber (1; Figure 1; column 2, line 3); an exhaust system having a turbo molecular pump (11a; Figure 1; column 5; lines 40-48) and a dry pump (11b; Figure 1; column 5; lines 40-48), configured to exhaust the treatment gases from said treatment chamber (1; Figure 1; column 2, line 3); a capturing unit (“remover (detoxicator)” 37; Figure 1; column 5; lines 35-40; column 7; lines 20-30), – claim 1. Applicant's claim requirement of “one of said at least two

kinds of treatment gases being liquid under atmospheric pressure” is a claim requirement of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey,152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

Ohmi further teaches:

- i. a substrate (2; Figure 1; column 2; line 10) treatment device (Figure 1; column 5) as set forth in claim 1, wherein the fine grains contained in said capturing unit (“remover (detoxicator)” 37; Figure 1; column 5; lines 35-40; column 7; lines 20-30) are zeolite (column 7; lines 13-30), as claimed by claim 2. However, applicant’s claim requirements of the capturing unit having “containing fine grains” is believed to be a claim requirement of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of

performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).

- ii. A substrate (2; Figure 1; column 2; line 10) treatment device (Figure 1; column 5) as set forth in claim 1, wherein said capturing unit (“remover (detoxicator)” 37; Figure 1; column 5; lines 35-40; column 7; lines 20-30) captures the treatment gas that is liquid or solid at room temperature and at atmospheric pressure, as claimed by claim 3. Applicant’s claim requirement is a claim requirement of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter, 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).
- iii. A substrate (2; Figure 1; column 2; line 10) treatment device (Figure 1; column 5) as set forth in claim 1, wherein the treatment gas captured by said capturing unit (“remover (detoxicator)” 37; Figure 1; column 5; lines 35-40; column 7; lines 20-30) is at least one of TiF₄, TiCl₄, TiBr₄, TiI₄, Ti[N(C₂H₅)₂]₂, Ti[N(CH₃)₂]₂, Ti[N(C₂H₅)₂CH₂]₂, TaF₅, TaCl₅, TaBr₅, TaI₅, Ta(NC(CH₃)₂)₂(N(C₂H₅)₂)₂, Ta(OC₂H₅)₂, and Ta(C₂H₅)₂Cl.

Al(CH₃)₂, Zr(O-t(C₂H₅)₂Cl₂).H₂O, b.4, ZrCl₄, SiH₃Cl, SiH₂Cl₂, SiH₂Cl₂Cl, and SiCl₄, as claimed by claim 4. Applicant's claim requirement is a claim requirement of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter, 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).

- iv. A substrate (2; Figure 1; column 2; line 10) treatment device (Figure 1; column 5) comprising: a treatment chamber (1; Figure 1; column 2, line 3) in which a substrate (2; Figure 1; column 2; line 10) is to be placed; a supply system (4,10; Figure 1; column 2; lines 5-20) configured to supply at least two kinds of treatment gases to said treatment chamber (1; Figure 1; column 2, line 3); an exhaust system having a turbo molecular pump (11a; Figure 1; column 5; lines 40-48) and a dry pump (11b; Figure 1; column 5; lines 40-48), configured to exhaust the treatment gases from said treatment chamber (1; Figure 1; column 2, line 3); and a capturing unit (“remover (detoxicator)” 37; Figure 1; column 5; lines 35-40; column 7; lines 20-30) – claim 6. Applicant's claim requirement of “one of said at least two kinds of treatment gases being liquid under atmospheric pressure” is a claim requirement of intended use in the pending apparatus claims. Further,

it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey,152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

- v. A substrate (2; Figure 1; column 2; line 10) treatment device (Figure 1; column 5) as set forth in claim 6, wherein said capturing unit (“remover (detoxicator)” 37; Figure 1; column 5; lines 35-40; column 7; lines 20-30) has a metal oxide (column 7; lines 20-30) to capture the treatment gas, as claimed by claim 7
- vi. A substrate (2; Figure 1; column 2; line 10) treatment device (Figure 1; column 5) as set forth in claim 7, wherein the metal oxide (column 7; lines 20-30) is Al₁.sub.2O₁.sub.3, as claimed by claim 8
- vii. A substrate (2; Figure 1; column 2; line 10) treatment device (Figure 1; column 5) comprising: a treatment chamber (1; Figure 1; column 2, line 3) in which a substrate (2; Figure 1; column 2; line 10) is to be placed; a supply system (4,10; Figure 1; column 2; lines 5-20) configured to supply at least two kinds of treatment gases to said treatment chamber (1; Figure 1; column 2, line 3); an exhaust system having at least one pump (36; Figure 3; column 9; line 63 - column 10; line 63), configured to exhaust the treatment gases from said treatment chamber (1; Figure 1; column 2, line 3), an inert gas (column 3; lines 65-67) supply system (4,10; Figure 1; column 2; lines 5-20) configured to supply an

inert gas (column 3; lines 65-67) into said exhaust system; Ohmi's capturing unit (“remover (detoxicator)” 37; Figure 1; column 5; lines 35-40; column 7; lines 20-30) absorbing by a chemical action (“oxidation reactions”; column 7; lines 20-30) at least one kind of the treatment gas exhausted from said treatment chamber (1; Figure 1; column 2, line 3) – claim 10

- viii. A substrate (2; Figure 1; column 2; line 10) treatment device (Figure 1; column 5) as set forth in claim 10, wherein the inert gas (column 3; lines 65-67) includes at least one of Ar, He, and N._{sub.2}, as claimed by claim 11
- ix. A substrate (2; Figure 1; column 2; line 10) treatment device (Figure 1; column 5) as set forth in claim 10, wherein the treatment gases include at least one of TiF._{sub.4}, TiCl._{sub.4}, TiBr._{sub.4}, TiI._{sub.4}, Ti[N(C._{sub.2}H._{sub.5}CH._{sub.3})._{sub.2}]._{sub.4}, Ti[N(CH._{sub.3})._{sub.2}]._{sub.4}, Ti[N(C._{sub.2}H._{sub.5})._{sub.2}]._{sub.4}, TaF._{sub.5}, TaCl._{sub.5}, TaBr._{sub.5}, TaI._{sub.5}, Ta(NC(CH._{sub.3})._{sub.3})(N(C.-_{sub.2}H._{sub.5})._{sub.2})._{sub.3}, Ta(OC._{sub.2}H._{sub.5})._{sub.5}, Al(CH._{sub.3})._{sub.3}, Zr(O-t(C._{sub.4}H._{sub.9}))._{sub.4}, ZrCl._{sub.4}, SiH._{sub.4}, Si._{sub.2}H._{sub.6}, SiH._{sub.2}Cl._{sub.2}, and SiCl._{sub.4}, as claimed by claim 12. Applicant's claim requirement is a claim requirement of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the

intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).

Ohmi does not teach:

- i. Ohmi's capturing unit ("remover (detoxicator)" 37; Figure 1; column 5; lines 35-40; column 7; lines 20-30) *interposed* between said treatment chamber (1; Figure 1; column 2, line 3) and said turbo molecular pump (11a; Figure 1; column 5; lines 40-48) and said dry pump (11b; Figure 1; column 5; lines 40-48) and containing fine grains, the capturing unit ("remover (detoxicator)" 37; Figure 1; column 5; lines 35-40; column 7; lines 20-30) configured to capture by the fine grains at least one kind of the treatment gas exhausted from said treatment chamber (1; Figure 1; column 2, line 3); a trap with a cooled plate member therein provided between said turbo molecular pump (11a; Figure 1; column 5; lines 40-48) and said dry pump (11b; Figure 1; column 5; lines 40-48), the trap to physically absorbing powder by said cooled plate member – claims 1, 6, 10. However, applicant's claim requirements of the capturing unit having "containing fine grains" is believed to be a claim requirement of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter, 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re

Casey,152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

- ii. A substrate (2; Figure 1; column 2; line 10) treatment device (Figure 1; column 5) as set forth in claim 1, further comprising: a supply controller (12; Figure 1; column 9; line 63 - column 10; line 63) configured to control said supply system (4,10; Figure 1; column 2; lines 5-20) to supply the treatment gases alternately, as claimed by claim 5.
- iii. A substrate (2; Figure 1; column 2; line 10) treatment device (Figure 1; column 5) as set forth in claim 6, further comprising: a supply controller (12; Figure 1; column 9; line 63 - column 10; line 63) configured to control said supply system (4,10; Figure 1; column 2; lines 5-20) to alternately supply the treatment gases, as claimed by claim 9.
- iv. an inert gas (column 3; lines 65-67) supply system (4,10; Figure 1; column 2; lines 5-20) configured to supply an inert gas (column 3; lines 65-67) into said exhaust system that is on a *downstream* side of the dry pump (11b; Figure 1; column 5; lines 40-48) on a final stage - claim 10
- v. A substrate (2; Figure 1; column 2; line 10) treatment device (Figure 1; column 5) as set forth in claim 10, further comprising: a supply controller (12; Figure 1; column 9; line 63 - column 10; line 63) configured to control said supply system (4,10; Figure 1; column 2; lines 5-20) to alternately supply the treatment gases, as claimed by claim 13.

Beyer teaches an apparatus for regulating pressure in a semiconductor process chamber (Figure 12; column 1; lines 7-20) including plural vacuum pumps (2,4; Figure 12; column 1; lines 7-20) and gas injection downstream of Beyer's vacuum pump (2; Figure 12; column 1; lines 7-20).

Miyashita also teaches a similar apparatus for regulating pressure in a semiconductor process chamber (1; Figure 2) including plural vacuum pumps (4,7a; Figure 2). Miyashita further teaches a trap (5; Figure 2 – “powder trap 5”) with a cooled plate member (not numbered – compare 3,5 with 45,45b of Applicant’s Figure 2), the trap configured to physically absorb powder (abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made for Ohmi to add an additional vacuum pump downstream of Ohmi’s capturing unit (“remover (detoxicator)” 37; Figure 1; column 5; lines 35-40; column 7; lines 20-30) and gas injection, as taught by Beyer, further, to optimize the operation of Ohmi’s supply controller (12; Figure 1; column 9; line 63 - column 10; line 63).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Ohmi to add Miyashita’s powder trap (5; Figure 2 – “powder trap 5”).

Motivation for Ohmi to add an additional vacuum pump downstream of Ohmi’s capturing unit (“remover (detoxicator)” 37; Figure 1; column 5; lines 35-40; column 7; lines 20-30) and gas injection is, as taught by Beyer, is for reaction chamber pressure control as taught by Beyer (column 10; lines 54-60) and increasing semiconductor process throughput as taught Beyer (column 1; lines 59-64).

Motivation for Ohmi to add Miyashita’s powder trap (5; Figure 2 – “powder trap 5”) is for controlling the formation of corrosive materials in a cooling trap as taught by Miyashita (abstract).

It would be obvious to those of ordinary skill in the art to optimize the operation of the claimed invention (In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980); In re Hoeschele , 406 F.2d 1403, 160 USPQ 809 (CCPA 1969); Merck & Co. Inc . v. Biocraft Laboratories Inc. , 874 F.2d

804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied , 493 U.S. 975 (1989); In re Kulling , 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990), MPEP 2144.05).

4. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmi; Tadahiro et al. (US 6217633 B1), Beyer; Christian et al. (US 5944049 A), Hayashi; Kazuichi et al. (US 5879139 A) and Miyashita, Takeshi et al. (JP 01188684 A). Ohmi, Beyer, and Miyashita are discussed above. Ohmi further teaches:

- i. A substrate (2; Figure 1; column 2; line 10) treatment device (Figure 1; column 5) comprising: a treatment chamber (1; Figure 1; column 2, line 3) in which a substrate (2; Figure 1; column 2; line 10) is to be placed; a supply system (4,10; Figure 1; column 2; lines 5-20) configured to supply at least two kinds of treatment gases into said treatment chamber (1; Figure 1; column 2, line 3); an exhaust system having a turbo molecular pump (11a; Figure 1; column 5; lines 40-48) and a dry pump (11b; Figure 1; column 5; lines 40-48), configured to exhaust the treatment gases from said treatment chamber (1; Figure 1; column 2, line 3), Ohmi's capturing unit ("remover (detoxicator)" 37; Figure 1; column 5; lines 35-40; column 7; lines 20-30) configured to capture by a chemical action ("oxidation reactions"; column 7; lines 20-30) at least one kind of the treatment gas exhausted from said treatment chamber (1; Figure 1; column 2, line 3) – claim 14. Applicant's claim requirement of "one of said at least two kinds of treatment gases being liquid under atmospheric pressure" is a claim requirement of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus

claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

- ii. A substrate (2; Figure 1; column 2; line 10) treatment device (Figure 1; column 5) as set forth in claim 14, wherein the treatment gases include at least one of TiF.sub.4, TiCl.sub.4, TiBr.sub.4, TiI.sub.4, Ti[N(C.sub.2H.sub.5CH.sub.3).sub.2].sub.4, Ti[N(CH.sub.3).sub.2].sub.4, Ti[N(C.sub.2H.sub.5).sub.2].sub.4, TaF.sub.5, TaCl.sub.5, TaBr.sub.5, TaI.sub.5, Ta(NC(CH.sub.3).sub.3)(N(C.-sub.2H.sub.5).sub.2).sub.3, Ta(OC.sub.2H.sub.5).sub.5, Al(CH.sub.3).sub.3, Zr(O-t(C.sub.4H.sub.9)).sub.4, ZrCl.sub.4, SiH.sub.4, Si.sub.2H.sub.6, SiH.sub.2Cl.sub.2, and SiCl.sub.4, as claimed by claim 15. Applicant's claim requirement is a claim requirement of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter, 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

Ohmi and Beyer do not teach:

- i. Ohmi's capturing unit ("remover (detoxicator)" 37; Figure 1; column 5; lines 35-40; column 7; lines 20-30) *interposed* between said treatment chamber (1; Figure 1; column 2, line 3) and said turbo molecular pump (11a; Figure 1; column 5; lines 40-48) and said dry pump (11b; Figure 1; column 5; lines 40-48), the capturing unit ("remover (detoxicator)" 37; Figure 1; column 5; lines 35-40; column 7; lines 20-30) absorbing by a chemical action ("oxidation reactions"; column 7; lines 20-30) at least one kind of the treatment gas exhausted from said treatment chamber (1; Figure 1; column 2, line 3); a trap with a cooled plate member therein provided between said turbo molecular pump (11a; Figure 1; column 5; lines 40-48) and said dry pump (11b; Figure 1; column 5; lines 40-48), the trap to physically absorbing powder by said cooled plate member – claim 14
- ii. a heater configured to heat said exhaust system that is on a downstream side of the dry pump (11b; Figure 1; column 5; lines 40-48) on a final stage – claim 14
- iii. A substrate (2; Figure 1; column 2; line 10) treatment device (Figure 1; column 5) as set forth in claim 14, further comprising: a supply controller (12; Figure 1; column 9; line 63 - column 10; line 63) configured to control said supply system (4,10; Figure 1; column 2; lines 5-20) to supply said treatment gases alternately, as claimed by claim 16.

As Beyer, Hayashi also teaches an apparatus for regulating pressure in a semiconductor process chamber (Figure 1; column 3 line 61 – column 4; line 10) including plural vacuum pumps (72,4; Figure 1; column 3 line 61 – column 4; line 10). Hayashi further teaches a heater (66; Figure 1; column 3 line 61 – column 4; line 10) configured to heat said exhaust system (system below 2; Figure 1) that is on a downstream side of the pump (4; Figure 1; column 3 line 61 – column 4; line 10).

Miyashita also teaches a similar apparatus for regulating pressure in a semiconductor process chamber (1; Figure 2) including plural vacuum pumps (4,7a; Figure 2). Miyashita further teaches a trap (5; Figure 2 – “powder trap 5”) with a cooled plate member (not numbered – compare 3,5 with 45,45b of Applicant’s Figure 2), the trap configured to physically absorb powder (abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made for Ohmi and Beyer to add Hayashi’s exhaust heater to the apparatus of Ohmi and Beyer as taught by Hayashi, further, to optimize the operation of Ohmi’s supply controller (12; Figure 1; column 9; line 63 - column 10; line 63).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Ohmi to add Miyashita’s powder trap (5; Figure 2 – “powder trap 5”).

Motivation for Ohmi and Beyer to add Hayashi’s exhaust heater to the apparatus of Ohmi and Beyer as taught by Hayashi is for preventing the exhaust gases from condensing to liquid as taught by Hayashi (column 5; line 55 – column 6, line 3).

Motivation for Ohmi to add Miyashita’s powder trap (5; Figure 2 – “powder trap 5”) is for controlling the formation of corrosive materials in a cooling trap as taught by Miyashita (abstract).

It would be obvious to those of ordinary skill in the art to optimize the operation of the claimed invention (In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980); In re Hoeschele , 406 F.2d 1403, 160 USPQ 809 (CCPA 1969); Merck & Co. Inc . v. Biocraft Laboratories Inc. , 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied , 493 U.S. 975 (1989); In re Kulling , 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990), MPEP 2144.05).

Response to Arguments

5. Applicant's arguments filed December 19, 2008 have been fully considered but they are not persuasive.

6. Applicant states at page 10:

"

Applicants respectfully submit that the cited portions of Okmi do not disclose, teach, or render obvious at least the feature of "an exhaust system having a turbo molecular pump and a dry pump, configured to exhaust the treatment gases from said treatment chamber," as recited in claim 1. Ohmi's recovery pump 36 does not have a turbo molecular pump and a dry pump.

"

In response, the Examiner agrees because his prior action applied Ohmi's Figure 3 embodiment. However, the Examiner's new grounds of rejection applies Ohmi's Figure 1 which indeed teaches the claimed components amended and addressed above.

Applicant states:

"

Moreover, Applicants respectfully submit that the cited portions of Ohmi do not disclose, teach or render obvious at least the feature of "a capturing unit, interposed between said turbo molecular pump and said dry pump and containing fine grains, the capturing unit absorbing by the fine grains at least one kind of the treatment gas exhausted from said treatment chamber," as recited in claim 1. The detoxicator 73 of Ohmi does not correspond to the capturing unit in claim 1 for least the reason that the detoxicator 73 is not disposed between the recovery vacuum pump 36 and another pump. Thus, Ohmi's detoxicator 73 is not arranged between a turbo molecular

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pump and a dry pump, as recited in claim 1. Further, Ohmi's detoxicator 73 does not contain fine grains, as recited in claim 1.

“(page 11) and..

“

However, the cited portions of Beyer and Miyashita do not disclose or teach that the exhaust system contains the turbo molecular pump and the dry pump so that the trap and the capturing unit are provided between the turbo molecular pump and the dry pump, as recited in claim 1

“(page 11)

And..

“

The cited portions of Hayashi merely teach a vacuum processing apparatus with a vacuum pump, in which products of reaction in exhaust gas can be prevented from adhering to the inside of the vacuum pump by heating the inside of the vacuum pump to a temperature higher than the temperature at which products of reaction discharged from a process chamber are separated. See,

Abstract of Hayashi

“(page 14)

7. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The Examiner's application of the teachings of each of Beyer; Christian et al. (US 5944049 A) and Miyashita, Takeshi et al. (JP 01188684 A) demonstrates that it is well understood in the art to have *redundant* vacuum pumps

either in series or in other branches of exhaust conduits. As a result, the Examiner believes that the prior art suggests that it ... for Ohmi **to add** an additional vacuum pump downstream of Ohmi's capturing unit ("remover (detoxicator)" 37; Figure 1; column 5; lines 35-40; column 7; lines 20-30).

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1792 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.

/Rudy Zervigon/

Primary Examiner, Art Unit 1792